

**NATURAL RESOURCES CONSERVATION SERVICE**

**VIRGINIA CONSERVATION PRACTICE STANDARD**

**IRRIGATION WATER MANAGEMENT**

(Acre)

Code 449

**DEFINITION**

Irrigation water management is the process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.

**PURPOSE**

Irrigation water management is applied as part of a conservation management system to support one or more of the following:

- Manage soil moisture to promote desired crop response
- Optimize use of available water supplies
- Minimize irrigation induced soil erosion
- Decrease non-point source pollution of surface and groundwater resources
- Manage salts in the crop root zone
- Manage air, soil, or plant micro-climate

**CONDITIONS WHERE PRACTICE APPLIES**

This practice is applicable to all irrigated lands.

An irrigation system adapted for site conditions (soil, slope, crop grown, climate, water quantity and quality, etc.) must be available and capable of applying water to meet the intended purpose(s).

**CRITERIA**

**GENERAL CRITERIA APPLICABLE TO ALL PURPOSES**

All work shall comply with Federal, State, and local laws and regulations. Water shall not be applied in excess of the needs to meet the intended purpose.

**ADDITIONAL CRITERIA TO MANAGE SOIL MOISTURE TO PROMOTE DESIRED CROP RESPONSE**

The following principles shall be applied for various crop growth stages:

- The volume of water needed for each irrigation shall be based on plant available water holding capacity of the soil for the crop rooting depth, management allowed soil water depletion, irrigation efficiency, and water table contribution.
- The irrigation frequency shall be based on the volume of irrigation water needed and/or available, the rate of crop evapotranspiration, crop needs, and effective precipitation.
- The application rate shall be based on the volume of water to be applied, the frequency of irrigation applications, soil infiltration and permeability characteristics, and the capacity of the irrigation system.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

#### ADDITIONAL CRITERIA TO OPTIMIZE USE OF WATER SUPPLIES

Limited irrigation water supplies shall be managed to meet critical crop growth stages.

#### ADDITIONAL CRITERIA TO MINIMIZE IRRIGATION INDUCED SOIL EROSION

Application rates shall be consistent with local field conditions for long term productivity of the soil.

#### ADDITIONAL CRITERIA TO DECREASE NON-POINT SOURCE POLLUTION OF SURFACE AND GROUNDWATER RESOURCES

Water application shall be at rates that minimize transport of sediment, nutrients, and chemicals to surface waters and that minimize transport of nutrients and chemicals to groundwater.

A Nutrient Management Plan and/or a Pest Management Plan must be used when nutrients and pesticides are applied by injection into the irrigation system. A backflow prevention device must be installed to prevent contamination of the water source.

#### ADDITIONAL CRITERIA TO MANAGE AIR, SOIL, OR PLANT MICRO-CLIMATE

The irrigation system shall have the capacity to apply the required rate of water for cold or heat protection as determined by the methodology contained in the National Engineering Handbook (NEH), Part 623, Chapter 2.

### CONSIDERATIONS

The following items should be considered when planning irrigation water management:

- Consideration should be given to managing precipitation effectiveness and crop residues, and reducing system losses.
- Modify plant populations, crop and variety selection, and irrigated acres to match available or anticipated water supplies.

- Consider potential for spray drift and odors when applying agricultural and municipal wastewaters.
- Equipment modifications and/or soil amendments such as polyacrylamides and mulches should be considered to decrease erosion.
- Consider the quality of water and the potential impact to crop quality and plant development.
- Quality of irrigation water should be considered relative to its potential effect on the soil's physical and chemical properties, such as soil crusting, pH, permeability, salinity, and structure.
- Avoid traffic on wet soils to minimize soil compaction.
- Consider the effects that irrigation water has on wetlands, water related wildlife habitats, riparian areas, cultural resources, and recreation opportunities.
- Consider the effects that application of irrigation water has on nutrient and pest management. Virginia Conservation Practice Standards *Pest Management* (Code 595) and *Nutrient Management* (Code 590) should be used.
- Water should be managed in such a manner as to not drift or come in direct contact with surrounding electrical lines, supplies, devices, controls, or components that would cause shorts in the same or the creation of an electrical safety hazard to humans or animals.
- Consideration should be given to electrical load control/interruptible power schedules, repair and maintenance downtime, and harvest downtime.
- Consider improving the irrigation system to increase distribution uniformity of irrigation water application.
- Where practical, irrigation water should be captured for reuse.

## **PLANS AND SPECIFICATIONS**

Application of this standard may include job sheets or similar documents that specify the applicable requirements, system operations, and components necessary for applying and maintaining the practice to achieve its intended purpose(s).

## **OPERATION AND MAINTENANCE**

There are no operation and maintenance (O&M) aspects applicable to this standard. Necessary O&M items are addressed in the physical component standards considered companions to this standard.

## **REFERENCES**

1. National Engineering Handbook, Section 15, Irrigation.

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**Approved Practice Narratives**

(Acre)

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449 D1 Irrigation Water Management:

Irrigation water management is applied to manage soil moisture to promote desired crop response.

449 D2 Irrigation Water Management:

Irrigation water management is applied to optimize use of available water supplies.

449- D3 Irrigation Water Management:

Irrigation water management is applied to minimize irrigation induced soil erosion.

444 D4 Irrigation Water Management:

Irrigation water management is applied to decrease nonpoint source pollution of surface and groundwater resources.

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